

CLAIMS

1. An information recording apparatus for recording record information onto an information recording medium comprising at least: a first recording layer in which a first recording area can be formed, and a second recording layer which has a relative discrepancy with the first recording layer in a radial direction and in which a second recording area can be formed,

said information recording apparatus comprising:

a writing device capable of writing the record information into the first recording layer and the second recording layer;

an obtaining device for obtaining offset information which indicates the relative discrepancy;

a calculating device for calculating an address which indicates a second border point of the second recording layer facing a first border point of the first recording layer, on the basis of the obtained offset information; and

a controlling device for controlling said writing device to write the record information (i) to form the first recording area, with the first border point as a recording end position or a recording start position, and (ii) to form the second recording area, with the second border point which is indicated by the calculated address as a recording end position or a recording start position.

2. The information recording apparatus according to claim 1, wherein

said information recording medium further comprises a management area to record therein the offset information corresponding to said information recording medium,

said obtaining device obtains the offset information by reading the offset information from the management area, and

said calculating device calculates the address which indicates the second border point, on the basis of the obtained offset information.

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3. The information recording apparatus according to claim 1, further comprising a storing device for storing the offset information corresponding to said information recording medium,

said calculating device calculating the address which indicates the second border point, on the basis of the stored offset information.

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4. The information recording apparatus according to claim 1, wherein said information recording medium comprises, as the first recoding layer and the second recording layer:

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at least one of

(i) a data area to record therein the record information;

(ii) a fixed buffer area in which a radial position is fixed, which is formed by recording buffer data which is at least one portion of the record data, and which is to prevent a recording or reproduction position with respect to the first recording layer and the second recording layer from deviating to an unrecorded area; and

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(iii) a variable buffer area which is located on an inner circumferential side of the fixed buffer area, which can be located adjacently to the data area, and which is variable-length, and which is to prevent the recording or reproduction position from deviating to the unrecorded area,

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said calculating device calculates an address which indicates a second

outer circumferential end of the variable or fixed buffer area in the second recording layer, facing a first outer circumferential end of the variable or fixed buffer area in the first recording layer, on the basis of the obtained offset information and a data amount of the variable or fixed buffer area, and

5 said controlling device controls said writing device to write the buffer data until the first outer circumferential end, as well as from the second outer circumferential end, in response to a finalize instruction to said information recording medium.

10 5. The information recording apparatus according to claim 1, wherein
 said information recording medium comprises, as the first recoding layer and the second recording layer:

 at least one of

 (iv) a fixed calibration area in which a radial position is fixed, and in
15 which data for test writing, which is one portion of the record information, can be recorded in order to obtain an optimum recording power of laser light for recording; and

 (v) a variable calibration area which is located on an inner
circumferential side of the fixed calibration area, which can be located
20 adjacently to the data area, and which is variable-length, and in which the data for test writing can be recorded

 said calculating device calculates an address which indicates a second inner circumferential end of the variable or fixed calibration area in the second recording layer, facing a first inner circumferential end of the variable
25 or fixed calibration area in the first recording layer, and calculates an address which indicates a fourth outer circumferential end of the variable or fixed

calibration area in the second recording layer, facing a third outer circumferential end of the variable or fixed calibration area in the first recording layer, on the basis of the obtained offset information and a data amount of the variable or fixed calibration area, and

5 said controlling device controls said writing device to write the data for test writing into a section from the first inner circumferential end to the third outer circumferential end, as well as into a section from the second inner circumferential end to the fourth outer circumferential end, in response to an instruction for obtaining the optimum recording power to said information
10 recording medium.

6. The information recording apparatus according to claim 4, wherein said controlling device controls said writing device to write the record information while the variable or fixed calibration area is located on an outer
15 circumferential side of the variable or fixed buffer area.

7. The information recording apparatus according to claim 6, further comprising a judging device for judging whether or not the outer circumferential end of variable calibration area can be located on an inner
20 circumferential side of the inner circumferential end of the fixed buffer area, on the basis of the obtained offset information and the data amount of the variable buffer area and variable calibration area,

 said controlling device (i) controlling said writing device, to write the record information while the variable buffer area and the variable calibration
25 area are located on the inner circumferential side of the fixed buffer area and the fixed calibration area if it is judged that the outer circumferential end of

variable calibration area can be located by said judging device, and (ii) controlling not to dispose the variable buffer area and the variable calibration area if it is not judged that the outer circumferential end of variable calibration area can be located.

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8. The information recording apparatus according to claim 7, further comprising a spare capacity calculating device for calculating a spare capacity of a space area from the outer circumferential end of the variable calibration area to the inner circumferential end of the fixed buffer area,

10 said controlling device controlling said writing device to write the record information while (i) one portion of the calculated spare capacity is distributed into the variable buffer area, and (ii) another portion of the calculated spare capacity is distributed into the variable calibration area.

15 9. The information recording apparatus according to claim 4, wherein said controlling device controls said writing device to write the buffer data while the inner circumferential end of the variable or fixed buffer area in the second recording layer is located on the inner circumferential side of the inner circumferential end of the variable or fixed buffer area in the first recording
20 area.

10. An information recording method in an information recording apparatus comprising a writing device capable of writing record information into a first recording layer and a second recording layer, onto an information
25 recording medium comprising at least: the first recording layer in which a first recording area can be formed, and the second recording layer which has a

relative discrepancy with the first recording layer in a radial direction and in which a second recording area can be formed,

said information recording method comprising:

an obtaining process of obtaining offset information which indicates
5 the relative discrepancy;

a calculating process of calculating an address which indicates a second border point of the second recording layer facing a first border point of the first recording layer, on the basis of the obtained offset information; and

a controlling process of controlling said writing device to write the
10 record information (i) to form the first recording area, with the first border point as a recording end position or a recording start position, and (ii) to form the second recording area, with the second border point which is indicated by the calculated address as a recording end position or a recording start position.

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11. A computer program of instructions for recording control and for tangibly embodying a program of instructions executable by a computer provided in the information recording apparatus according to claim 1, to make the computer function as at least one of said writing device, said obtaining
20 device, said calculating device, and said controlling device.